

REMARKS

Applicant thanks the Examiner for his thoughtful review of the application. The status of the present application is as follows. **Claims 1 – 31** are pending. Independent **Claims 1 and 28 - 31** have been amended herein. The amendments to the claims are described below in the **Present Amendment**.

i. PRESENT AMENDMENT

Independent **Claims 1 and 28** were amended herein to particularly point out and distinctly claim the subject matter the Applicant regards as the invention. Specifically, an additional limitation of *“primarily”* was added to the claims to make it clear that the treatment to the at least one interface is primarily directed at the at least one interface itself. That is, the treatment has an influential or significant effect on the at least one interface and that effect changes a property of the at least one interface as opposed to a property of an entirety of the materials from which the interface is formed. Therefore, for the conductive bottom electrode and the multi-resistive state element the at least one treatment is directed towards the bottom interface. Similarly, for the conductive top electrode and the multi-resistive state element the at least one treatment is directed towards the top interface.

Additionally, **Claim 1** was amended to recite *“at least one treatment”* to comport the language of **Claim 1** with the claims depending therefrom. Support for the amendments can at least be found in Paragraphs 0010, 0051 – 0057, 0063, and 0073 – 0076 of the **Detailed Description** and in **Claims 2, 3, 5 – 7, 11, 19, 22, and 25 – 27** as originally filed.

Claims 29 – 30 were amended herein to depend from independent **Claim 28** and **Claim 31** was amended to depend from dependent **Claim 30**. The amendments to **Claims 29 – 31** provide the required antecedent basis for the elements recited therein.

Application No. 10/665,882
Responsive to Office action of June 8, 2005

page 9
August 8, 2005

ii. **ARGUMENT**

a. **Rejection of Claims 1 – 27 under 35 U.S.C. § 102(b) (139 Patent)**

A *prima facie* case under 35 U.S.C. § 102(b) requires the Examiner to cite a prior art reference that shows all of the elements of the rejected claim(s) either explicitly or inherently. The Applicant respectfully submits that the Examiner has failed to make a *prima facie* case under U.S.C. § 102(b) because the 139 patent (*Liu* hereinafter) does not disclose explicitly or inherently all of the elements as set forth in **Claim 1**.

First, the Examiner contends that *Liu* shows a bottom interface between a multi-resistive state element 14 and a bottom electrode 10 and the interface is created by their proximity. Similarly, the Examiner contends that a top interface is created by a conductive top electrode 15 and the multi-resistive state element 14 and the top interface is also created by their proximity (see *Liu* Fig. 1). Moreover, the Examiner further contends that in col. 5, lines 12 – 23, *Liu* discloses at least one interface subjected to a treatment directed towards changing properties of the at least one interface. A more fair reading of the cited section of *Liu* would clearly show that *Liu* merely states in reference to Fig. 2b, that a large resistivity change is driven by both a change of the CMR layer and changes in the electrode/CMR interfaces, and is generally not fully reversible.

Second, what *Liu* fails to explicitly or inherently disclose is that specific interfaces are subjected to a treatment primarily directed towards changing properties of those interfaces as is now recited in **Claim 1**. *Liu* is silent as to effectuating the large resistivity change by intentionally treating the electrode/CMR interfaces (e.g. subjecting the interface to at least one treatment).

Finally, the property change (e.g. resistivity) as disclosed in *Liu* does not occur as the result of a deliberate treatment of an interface, but is due instead to a change in the CMR layer and to changes in the electrode/CMR interfaces. The words "subjected to at least one treatment" are not explicitly or inherently disclosed in the cited section of *Liu* (col. 5, lines 20 -23). Essentially, the Examiners contention rests upon the joining of two

Application No. 10/665,882
Responsive to Office action of June 8, 2005

page 10
August 8, 2005

materials and the resulting interface of *Liu* being the equivalent of an interface subjected to at least one treatment primarily directed towards changing properties of the interface. A *prima facie* case under 35 U.S.C. § 102(b) cannot be sustained when the Examiner ignores express elements of **Claim 1** (e.g. an interface subjected to at least one treatment) and replaces them with language from *Liu*.

Consequently, all of the elements of **Claim 1** are not expressly or inherently disclosed in *Liu*. Therefore, **Claim 1** is patentably distinct and is not anticipated by *Liu* and the rejection of **Claim 1** under 35 U.S.C. § 102(b) ought to now be withdrawn.

For at least the same reasons as argued above for **Claim 1**, **Claims 2 – 26** inherit all of the limitations of **Claim 1** and are patentably distinct in view of *Liu*. The Examiner contends that *Liu* already teaches (see col. 5, lines 20 – 23) that an interface is created and it is immaterial in a product claim how the interface is created since it is the final product that is considered for patentability. The Applicant traverses that contention because the second paragraph of MPEP §2113 states in reference to *In re Garner*, that claim terms such as "etched", for example, are capable of construction as structural limitations. Therefore, the method by which the at least one interface of **Claim 1** is treated results in a structural element that is patentably distinct over what is inherently or explicitly disclosed by *Liu* because *Liu* is silent as to subjecting the electrode/CMR interfaces with a treatment that results in a structural difference in the interface.

Furthermore, the Applicant respectfully submits that the Examiner has misread *Liu* (col. 4, lines 55 – 59) in regards to the rejection of **Claim 5** because what is actually disclosed in the cited section is that a substrate is held in close proximity to a target irradiated by a pulsed laser such that a plume of materials from the target are deposited on the substrate. The substrate is held at an elevated temperature in an oxidizing environment (e.g. O₂) to form an oxide film (e.g. a CMR/HTSC film). Therefore, an entirety of the bulk of the CMR/HTSC film is oxidized during the pulsed laser deposition. In sharp contrast, in **Claim 5** the at least one treatment comprises exposing the interface to be treated with a gas. The treatment of **Claim 5** is not directed to treating an entire bulk layer to a gas. Therefore, **Claim 5** is not anticipated by *Liu* because *Liu* is

Application No. 10/665,882
Responsive to Office action of June 8, 2005

page 11
August 8, 2005

applying the gas to the entire layer as it is being grown over the course of the laser deposition and the gas is not directed toward changing a property of an interface but instead a property of the entire bulk material (e.g. CMR/HTSC). See *Liu* col. 4, lines 54 – 62, where the deposition of the CMR/HTSC layer occurs over a few minutes to several tens or hundreds of minutes and results in oxide films having thicknesses from 10 nm to 1000 nm. Clearly, *Liu* is oxidizing the entire bulk layer by exposing it to the O₂ and is not treating an interface between the electrode and the CMR.

Accordingly, **Claims 2 – 26** are patentably distinct and are not anticipated by *Liu* and the rejection of **Claims 2 – 26** under 35 U.S.C. § 102(b) ought to now be withdrawn.

b. Rejection of Claims 28 - 31 under 35 U.S.C. § 102(a) (*Liu* et al. Reference)

For at least the same reasons as argued above for independent **Claim 1**, **Claim 28** and its dependent claims are not anticipated by the *Liu* et al. reference (*Liu* hereinafter). First, in the cited section of *Liu* (PCMO Film Deposition), there is no disclosure of subjecting an interface to a treatment. Instead, as argued above for **Claim 5**, *Liu* discloses the same pulsed laser deposition process that grows a PCMO film (200nm – 600nm thick) on top of an electrode (e.g. 100nm thick Pt film). Instead of subjecting an interface to the O₂, *Liu* is oxidizing the bulk of the PCMO film insitu with the laser deposition such that the PCMO is oxidized as it grows.

Therefore, the Applicant respectfully submits the Examiner is wrong in his contention that because the device of *Liu* is formed in an O₂ ambient, then the formation in the ambient is considered a treatment that changes the device properties. As argued above, **Claim 28** recites subjecting an interface to a treatment primarily directed towards changing properties of the interface. The claim language selected by the Applicant does not read on changing properties of a bulk layer of material as is disclosed by *Liu*. Consequently, all of the elements recited in **Claim 28** are not explicitly or inherently disclosed in *Liu*; therefore, **Claim 28** is not anticipated by *Liu*.

Application No. 10/665,882
Responsive to Office action of June 8, 2005

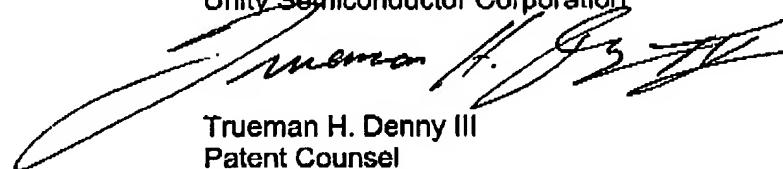
page 12
August 8, 2005

Accordingly, **Claims 28 – 31** are patentably distinct and are not anticipated by *Liu* and the rejection of **Claims 28 – 31** under 35 U.S.C. § 102(a) ought to now be withdrawn.

iii. **CONCLUSION**

Applicant now believes the present case to be in condition for allowance, and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application the undersigned can be reached at (408) 737-7200 x124.

Respectfully submitted,
Unity Semiconductor Corporation



Trueman H. Denny III
Patent Counsel
Reg. No. 44,652

250 North Wolfe Road
Sunnyvale, CA 94085-4510